March 29, 1932. H. J. HAMMERLY 1,851,248

ELECTRIC SWITCH

Filed Jan. 15, 1930 2 Sheets-Sheet 1

Fig. 1.

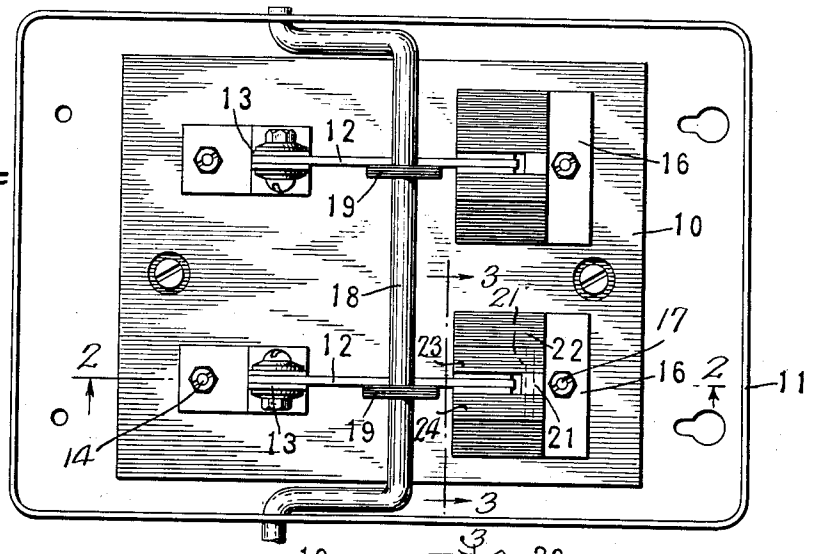



Fig. 2.

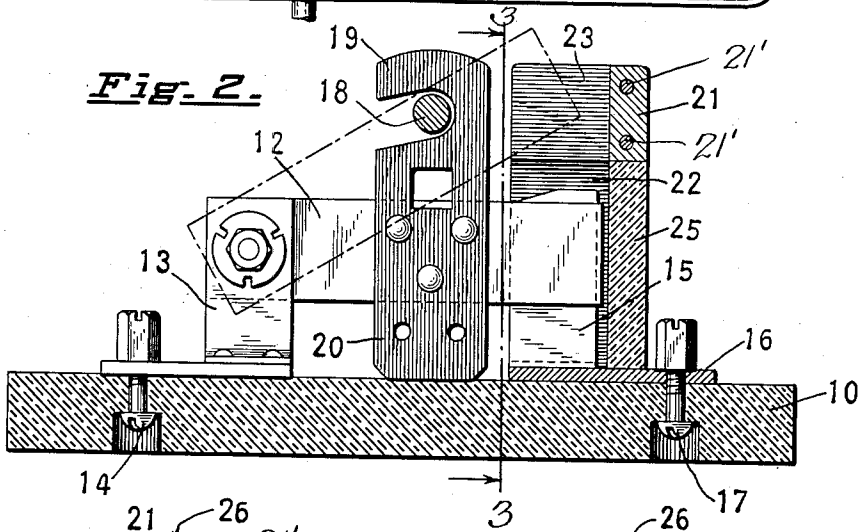



Fig. 3.

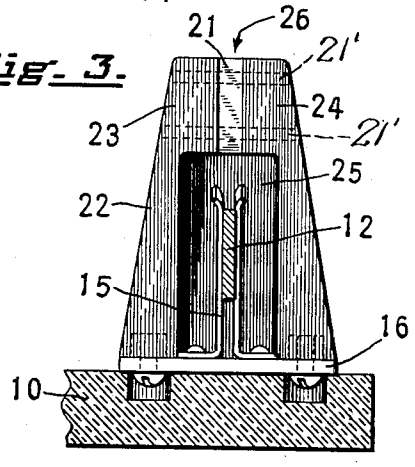
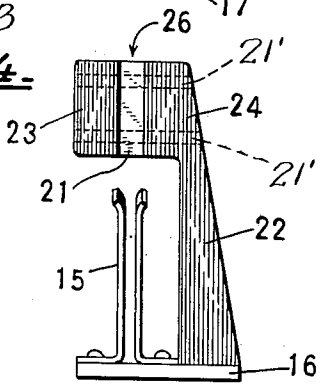



Fig. 4.

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Filed Jan. 15, 1930 2 Sheets-Sheet 2

Fig. 5.

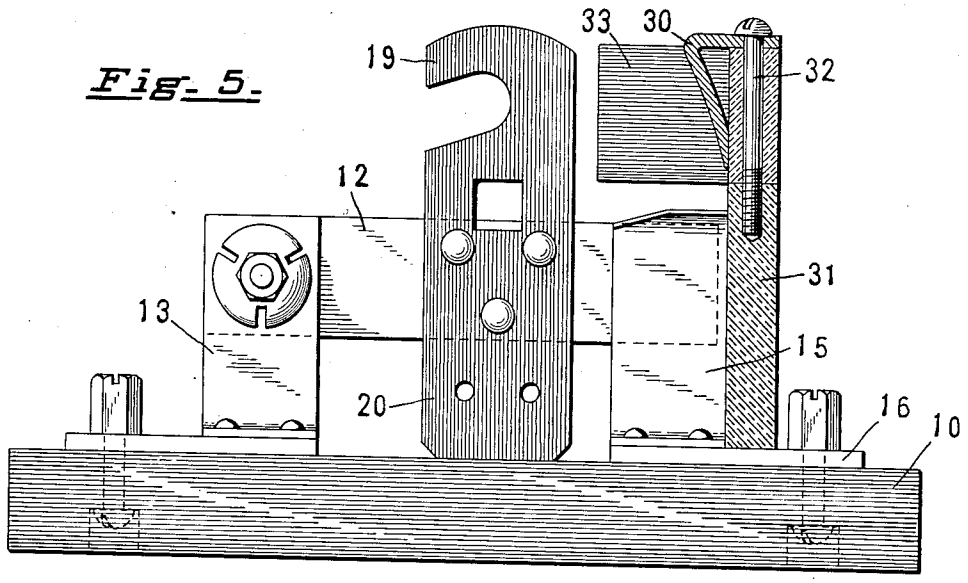



Fig. 6.

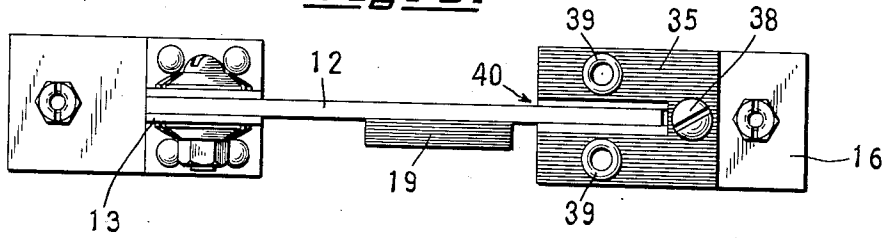
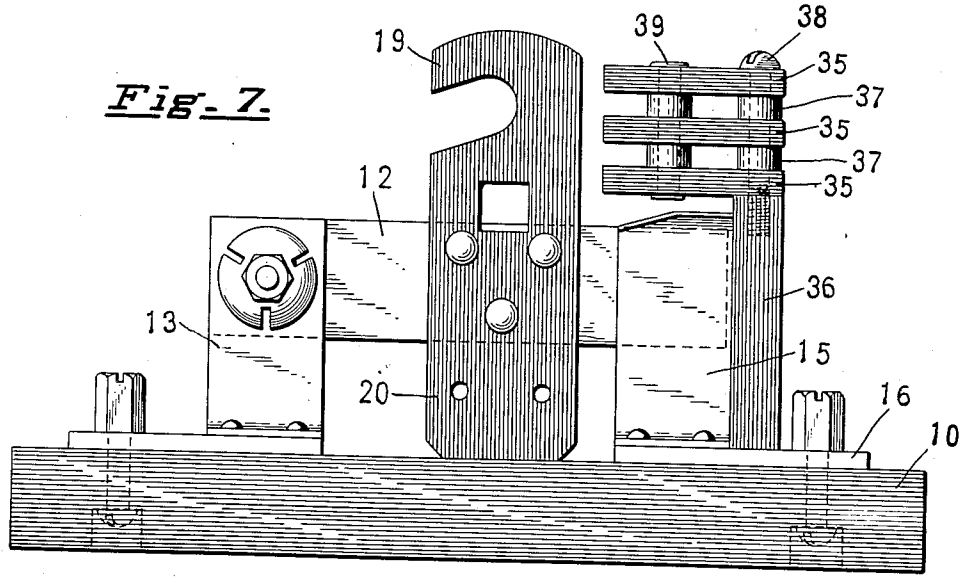



Fig. 7.

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Patented Mar. 29, 1932 1,851,248

# UNITED STATES PATENT OFFICE

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## ELECTRIC SWITCH

Application filed January 15, 1930. Serial No. 420,926.

This invention relates particularly to electric switches of the knife blade type.

The principal object of the invention is to provide a cheap, simple and efficient means for disrupting the arc of the circuit when the switch blade is moved away from the stationary contact jaws in the operation of opening the circuit

It has been found in practice that, if a block or body of conducting metal be positioned slightly away from the top far corner or tip of the stationary contact jaw and slightly beyond the path of the movable end of the blade, the arc caused by the separating of the contacts will tend to jump from the end of the blade to the block of metal and thus be divided and more easily broken and further, it is found in practice that if the block is positioned between a pair of insulating plates (or their equivalent) which are positioned at the sides of the path of the movable end of the blade, the combination will form a much more efficient means for disrupting the arc and the insulating plates will also prevent the arc from jumping sideways to any adjacent metal parts.

In the preferred form, one of the insulating plates is extended so as to form both a side barrier for the stationary contact jaw and a supporting foot by means of which the device may be secured to the base of the switch.

A second form is a somewhat cheaper form in which the insulating blocks are made from commercial forms of fibre or other insulating material.

In a third form the insulating plates may be built up of stampings of insulating material and the metal parts may be built up of commercial forms of washers, bushings, etc. Obviously with a small number of standard or regular parts, this third form may be made up in a variety of combinations.

Fig. 1 is a plan view of one form of switch construction embodying my invention, the parts being shown in a box.

Fig. 2 is an enlarged side view showing the switch parts in a closed circuit position and showing, in dot and dash lines, the switch blade in a position which it occupies when opening the circuit, the base and arc disrupting device being shown in section on the plane of the line 2—2 of Fig. 1.

Fig. 3 is an elevation of one of the arc snuffing parts showing a section of the base and the switch blade on the plane of the line 3—3 of Figs. 1 and 2.

Fig. 4 is a detail view showing a modification of the arc snuffing parts.

Fig. 5 is a side view and section showing another modification.

Fig. 6 is a plan view showing still another modification.

Fig. 7 is a side view of the form shown in Fig. 6 and also including a supporting base.

In switches of this character the current carrying parts are usually mounted on a base 10 of slate or other insulating material and the parts may be enclosed in a box 11 but details of the base and box are not involved in this invention.

The switch blade 12 is suitably hinged to a post or support 13 secured to the base in any suitable manner as, for instance, by a bolt or screw 14. The swinging end of the blade engages jaws 15 of any suitable type, which jaws are also supported on the base 10. For this purpose the jaws may have a foundation plate or foot 16 secured to the base by the screw or bolt 17.

Such switches are operated in various ways and in the drawings I have shown a conventional crank 18 hinged to the opposite walls of the box 11 and connected to a piece 19 which in turn is secured to the switch blade 12 so that when the crank 18 is operated in any suitable manner it will swing the blade 12 into and out of engagement with and from the spring jaws 15.

Obviously any number of switch units may be embodied in such a construction to take care of one, two or more circuits. The end 20 of the connector 19 serves as an abutment to limit the closing movement of the switch and also to assist in cuting off the arc which may tend to follow the blade from the jaws.

Above the jaws 15 and adjacent the path of movement of the end of the blade I mount a conducting piece 21 so close to the end of the blade and the outer corner of the jaw 15 that

an arc tending to form will jump to the piece 21 which furnishes a low resistance path for the current and thus tends to break the arc into two parts and consequently reduces its persistence. This arc disrupting member 21 may be supported in various ways, for instance, in the form shown in Figs. 1, 2 and 3, insulating post 22 is mounted on the plate 16 and pins 21' secure the piece 21 in the proper position. Preferably an insulating wall 23 is located alongside of the path of movement of the blade 12 and adjacent the disruptor 21 so as to restrict the movement of the arc and to act as an arc disrupting baffle.

A corresponding insulating wall 24 may be provided at the opposite side so as to provide a narrow groove 26 through which the end of the blade must pass. Another insulating wall 25 may be provided opposite the end of the jaw 15. Lateral insulating barriers such as 22, 23, 24, and 25 are desirable, particularly where metal of a different polarity is located adjacent the jaw such for instance as the jaw of another polarity or the wall of the enclosing box or receptacle.

It should be understood that various forms and arrangements of the arc disrupting members may be employed. For instance in Fig. 5, I have shown the metallic disruptor 30 in the form of a strip supported on a post 31 by means of a screw 32. This strip 30 is curved to correspond with the arc of movement of the end of the blade 12 so as to bring it as close as convenient to the blade. A lateral insulating baffle 33 may be employed alongside of the path of movement at the top of the blade if desired so as to assist in confining the movement of the arc and concentrating it upon the conducting strip 30. Such a combination tends to accentuate the disrupting action of the conducting disruptor.

In the form shown in Figs. 6 and 7 a number of layers of fibre 35 are supported by a post 36. Conducting washers 37 are interposed between the various layers of fibre and the parts secured to the post by means of a screw 38. Tubular rivets 39 serve to connect the layers of insulation and also serve to accentuate the arc deflecting action. These insulating plates 35 are in general of U-shape when viewed in plan and are provided with grooves 40 through which the tip of the blade 12 passes in its movement. The walls of this groove serve to confine the arc and the conducting portions 37, 38 and 39 serve as conductors for the arc so as to break up the arc into several parts and thus reduce its persistence and render damage unlikely.

Other changes in details in construction and arrangement may be made within the scope of my invention.

I claim:

1. In an electric switch an insulating base, a hinge post mounted thereon, a switch blade hinged to said post, a stationary contact secured to the base and adapted to be engaged by the movable end of said blade, insulating means mounted on opposite sides of said stationary contact and projecting beyond the end thereof and having an open slot for the passage of the movable end of the switch blade adjacent the end of the contact and an arc disrupting conducting member supported between portions of said insulating means at the end of said slot alongside the path of movement of the end of the switch blade.

2. In an electric switch, a supporting base, a post carried thereby, a switch blade hinged to said post, a stationary contact engaged by the movable end of said blade, an insulating post supported adjacent said contact and having insulating surfaces beyond the end of the contact and spaced apart from each other to form a slot for the passage of the movable end of the switch blade and a conducting arc disrupting member carried by said post and exposed in said slot.

3. In a switch, a hinged knife blade, a stationary contact mounted to receive the free end of said blade, a conducting arc disruptor mounted adjacent the path of movement of the end of the blade, insulating means arranged on opposite sides of the contact and providing a groove for the passage of the free end of the blade and supporting said disruptor.

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